# Adding, Subtracting, Multiplying, and Dividing Integers

Presented by

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# On an Index Card

- On front of the index card, please write the following information: **your name, grade level you teach, and your site**.

- On back of the card, please respond to the question, "**Why is it important for our students to master the four operations of integers**?"

# Agenda (9:00-10:30)

- 9:00- 9:15 Introduction
- 9:15- 10:15 Presentation
- 10:15- 10:30 Questions, answers, feedback, & evaluation

# Standards

- 6 NS 2.3
  - Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations.
- 7 AF 4.1
  - Solve two-step liner equations and inequalities...
- Algebra 1:  4
  - Students simplify expressions prior to solving linear equations and inequalities in one variable, such as 3 (2x+5) + 4(x-2) = 12.

# Objectives

- Content Objective: Teachers will identify patterns and construct conceptual and procedural understanding of four operations of integers.
- Pedagogy Objective: Teachers will make observations of the five phases of direct instruction and SIOP (Sheltered Instruction Observation Protocol) components with other research-based cognitive, teaching, content, and language strategies.
- Language Objective: Teachers will rehearse sentence frames by using the integer problems and RTQs.

# Supplementary Materials

- Algebra tiles
- Foldables
- Manipulatives
- McDougal Littell TEs (G. 6, 7, & 8)
- RTQs

# Knowing the Rigor on the CST (G. 6, # 28)

**- 4 + (- 3)** =

A - 7

B -1

C 1

D 7

# RTQ (G. 6, #26)

**12 ÷ - 3 =**

A 9

B 4

C $-\frac{1}{4}$

D - 4

# Stating the Importance

Why is it important for our students to master the four operations of integers?

# Developing the Vertical Lenz

- Knowing the rigor on CSTs
  - From grades 6, 7, 8, and beyond

# RTQ (G. 6, # 41)

If X – 3 = 6, what is the value of X ?

A 2

B 3

C 6

D 9

# RTQ (G. 6, #42)

What is X if 3X = 84?

A 20
B 21
C 26
D 28

# RTQ (G. 6, # 26)

What value of r makes $\frac{r}{-11} = -3$ true?

A - 33

B - 8

C 8

D 33

# RTQ (G. 6, # 46)

A telephone company charges $0.05 per minute for local calls and $0.12 per minute for long-distance calls. Which expression gives the total cost in dollars for x minutes of local calls and y minutes of long-distance calls?

A $0.05x + 0.12y$

B $0.05x – 0.12y$

C $0.17 (x+y)$

D $0.17 xy$

# RTQ (G. 7, # 59)

- What is the value of X if

  $-3X + 2 = -7$

A $X = -6$

B $X = -3$

C $X = 3$

D $X = 6$

# RTQ (G. 7, # 61)

What value of X satisfies the equation

4 X + 2 = 22 ?

A 3.5

B 5.0

C 6.0

D 7.5

# RTQ, Algebra 1 (# 6)

What is the solution for this equation?

$|2x - 3| = 5$

A $x = -4$ or $x = 4$

B $x = -4$ or $x = 3$

C $x = -1$ or $x = 4$

D $x = -1$ or $x = 3$

# RTQ, Algebra 1 (#8)

Which equation is equivalent to

$5x - 2(7x + 1) = 14x$ ?

A $-9x - 2 = 14x$

B $-9x + 1 = 14x$

C $-9x + 2 = 14x$

D $12x - 1 = 14x$

# RTQ, Algebra 1 (# 14)

What is the solution to the inequality

$X - 5 > 14$ ?

A $X > 9$

B $X > 19$

C $X < 9$

D $X < 19$

# Key Vocabulary

- Add
- Take away
- Make zero pairs
- Sum
- Difference
- Product
- Multiply
- Quotient
- Divide

# Academic Vocabulary

- Values
- Evaluate
- Expression
- Satisfy
- Solution
- Equation
- Equivalent
- Equality
- Inequality

# Essential Question

- How do you ___ two integers?

# Direct Instruction

(Joyce, Weils, & Calhoun, 2005; Hollingsworth, 2009)

- Orientation
- Presentation
- Highly Structured Practice
- Guided Practice
- Independent Practice

# Sheltered Instruction Observation Protocol (SIOP)
(Echevarria, Vogt, & Short, 2008)

- Lesson Preparation
- Building Background
- Comprehensible Input
- Strategies
- Interaction
- Practice & Application
- Lesson Delivery
- Review & Assessment

# Checking for Understanding
## (EDI, Hollingsworth, 2009)

- **T**each first before asking the question
- **A**sk a question
- **P**ause
- **P**ick a random non-volunteer
- **L**isten to the response
- **E**ffective feedback: echo, elaborate, & explain

# Engagement Strategies

- Note taking strategies (foldables)
- Use of sentence frames
- Choral response
- Use of questions
- MTS (Math Teaches) = yes, yes, yes
- TPS (Think, Pair, Share) = yes, yes, yes
- Integration of nonlinguistic representations
- Setting objectives and providing feedback
- Questions, cues, and advance organizers

# Sentence starters and frames

- The sum of ___ and ___ is ___.
- The value, ___ is the sum of ___ and ___.
- The difference of ___ and ___ is ___.
- The value, ___ is the difference of __ and __.
- The product of ___ multiply by ___ is ___.
- The value, ___ is the product of the factor___ and factor___.
- The quotient of ___ divide by ___ is ___.
- The value, ___ is the quotient of the dividend (numerator)___ and divisor (denominator)___.

# Review & Assessment Activity

- Play a Game: Relay
  - Prepare 6 stacks (1 stack = 5 problems)
  - Form groups
  - Have each group solve 5 problems
  - Each member of the group must solve each problem independently, agree on the solution before asking the teacher to verify the answers, and make responsible choices during the game.

# Did we attain our objectives?

- Did we identify patterns and construct conceptual and procedural understanding of four operations of integers?
- Did we make observations of the five phases of direct instruction and SIOP (Sheltered Instruction Observation Protocol) components with other research-based strategies?
- Did we rehearse sentence frames by using the integer problems and RTQs?

# Evaluation

- Thank you very much for participating in this workshop and travel safely!